Remarks

Claims 1-64 are pending in the above patent application. Claims 1-44 were objected to. Claims 45-64 were allowed. Claims 61 and 64 are amended to correct informailities. Applicant cancels claims 1-44, and argues that the present application is in condition for allowance. Applicant respectfully requests reconsideration and allowance. The Examiner is invited to call Applicant's undersigned attorney should he feel that such a call would further the prosecution of the patent application.

Respectfully submitted,
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Claims after response to First Office Action

1.(cancelled) An imaging system for capturing an image from image-bearing radiation, the imaging system comprising:

a camera housing;

optic means disposed within the camera housing for collecting the image-bearing radiation and defining an optical path;

an image amplifier disposed within the camera housing along the optical path such that image amplifier electronically amplifies the image in the image-bearing radiation; and

a detector disposed in the optical path, the detector being adapted to convert the image into an electronic signal representative of the image.

2.(cancelled) The imaging system according to claim 1 further comprising a scintillator converts the radiation into a visible light spectrum.

3.(cancelled) The imaging system according to claim 2 wherein the scintillator converts x-ray radiation.

4.(cancelled) The imaging system according to claim 2 wherein the scintillator converts ultra-violet radiation.

5.(cancelled) The imaging system according to claim 1 further comprising display means in electrical communication with the detector for receiving the electronic signal and displaying the image transmitted thereby.

6.(cancelled) The imaging system according to claim 1 wherein the image amplifier further comprises a photocathode which translates the image-bearing radiation into electron emissions.

7.(cancelled) The imaging system according to claim 6 wherein the photocathode is fabricated of gallium-arsenide to convert infrared radiation into the electron emission

8.(cancelled) The imaging system according to claim 6 wherein the detector is an Intensified Charge-Coupled Device.

9.(cancelled) The imaging system according to claim 1 further comprising a radiation source that projects radiation toward an object creating the image bearing radiation from the object, the radiation source being adapted to electronically shifts between a plurality of positions of the radiation such that the image transmitted by the image-bearing radiation changes for each of the plurality of positions.

10.(cancelled) The imaging system according to claim 9 wherein the radiation source electronically shifts between two positions generating stereo-pairs of three-dimensional images.

11.(cancelled) The imaging system according to claim 1 wherein color images are created by filtering the image-bearing radiation consecutively through a plurality of filters thus creating a

plurality of sub-images, the imaging system further comprising processing means for correcting motion in the color images by correcting and correlating the plurality of subimages.

12.(cancelled) A medical imaging system for detecting abnormalities in tissue, the medical system comprising:

a radiation source that projects radiation into the tissue, the radiation being selectively absorbed by the tissue thereby imparting an image onto the radiation defining a radiation shadow.

a radiation converter in optical alignment with the radiation source, the radiation converter converting the radiation shadow, and thus the image transmitted thereby, into image-bearing visible light; and

a photosensitive medium in optical communication with the radiation converter such that the image-bearing visible light generates and image of the tissue and abnormalities therein.

13.(cancelled) The medical imaging system according to claim 12 further comprising a photocathode disposed between the radiation converter and the photosensitive medium where the photocathode converts image-bearing visible light into an electron stream which is projected onto the photosensitive medium.

14.(cancelled) The medical imaging system according to claim 13 wherein the photosensitive medium is an Intensified Charge-Coupled Device.

15.(cancelled) The imaging system according to claim I wherein the radiation converter comprises:

a scintillator that converts the radiation shadow into the image-bearing visible light; and

optical transmission means in optical communication with the scintillator for transmitting the image-bearing visible light to the photosensitive medium.

16.(cancelled) The medical imaging system according to claim 15 wherein the scintillator has a density of at least 6 grains per cubic centimeter.

17.(cancelled) The medical imaging system according to claim 15 wherein the scintillator is fabricated of cadmium tungsten oxide or lutetium oxyorthosilicate.

18.(cancelled) The medical imaging system according to claim 12 wherein the radiation source is selectively movable to project the radiation between a plurality of positions such that the radiation shadow changes for each of the plurality of positions.

19.(cancelled) The medical imaging system according to claim 18 wherein the radiation source electronically shifts between two positions generating stereo-pairs of three-dimensional images.

20.(cancelled) The medical imaging system according to claim 18

wherein the radiation source is continuously deflected producing a plurality of radiation shadows that can be interactively "focused" to various levels within the tissue.

21.(cancelled) The medical imaging system according to claim 18 further comprising processing means for differentiating between foreground and background in the plurality of radiation shadows such that the background can be subtracted from the image.

22.(cancelled) The medical imaging system according to claim 21 wherein the processing means is adapted to replaced the background with a second background.

23.(cancelled) The medical imaging system according to claim 18 wherein the radiation source projects divergent rays of the radiation.

24.(cancelled) The medical imaging system according to claim 12 wherein color images are created by filtering the image-bearing radiation consecutively through a plurality of filters thus creating a plurality of sub-images, the imaging system further comprising processing means for correcting motion in the color images by removing blur and correlating the sub-images.

25.(cancelled) The medical imaging system according to claim 12 wherein the radiation source projects white light and the detector

is disposed opposed to the radiation source with the tissue interposed therebetween.

26.(cancelled) The medical imaging system according to claim 12 wherein the radiation source projects white light which is reflected from the tissue, the medical imaging system further comprising fiber optic means for collecting the white light reflected from the tissue and communicating the white light to the detector.

27.(cancelled) A method of correcting for motion in an image generated by capturing two or more consecutive sub-images, the method comprising the steps of:

calculating amplitudes of low harmonics of a first image of the two or more consecutive sub-images;

mapping a coordinate transformation of first image into a second image of the two or more consecutive sub-images;

computing corresponding transformations of the two or more consecutive sub-images by interpolation; and

reconstructing the image from the two or more consecutive sub-images.

28.(cancelled) The method according to claim 26 further comprising the step of establishing a pixel-to-pixel correspondence by computing interpolated pixel values.

29.(cancelled) A detector for use in an electronic imaging system comprising an active area divided into a plurality of rows and columns where each of the plurality of rows is adapted to be independently shifted up or down.

30.(cancelled) The detector according to claim 29 wherein the detector incorporates Multi-Pinned Phase (MPP) technology to reduce dark current.

31.(cancelled) The detector according to claim 29 wherein the detector is chemically etched in an isotropic etching solution in a rotating disc system.

32.(cancelled) The detector according to claim 29 further comprising field means for generating a stable electric field proximal to a back-side surface of the detector.

33.(cancelled) The detector according to claim 29 wherein the field means is dynamically selectable to adjust demagnification of the detector so as to govern a area of an abject to be imaged.

34.(cancelled) The detector according to claim 29 wherein the detector has a stable "dead layer" created by ion implantation.

35.(cancelled) A method for fabricating a radiation converter having a high resolution, the method comprising:

attaching a scintillator to a light guide; and

machining a surface of the scintillator to a predetermined thickness.

36.(cancelled) The method according to claim 35 wherein the scintillator has a high density.

37.(cancelled) The method according to claim 36 wherein the scintillator has a density 3 of at least about 8 grams/cm^3.

38.(cancelled) The method according to claim 35 wherein the scintillator is machined to the predetermined thickness of approximately 50 microns thickness.

39.(cancelled) The method according to claim 35 wherein the scintillator is fabricated of cadmium tungsten oxide.

40.(cancelled) The method according to claim 35 wherein the scintillator is fabricated of lutetium oxyorthosilicate.

41.(cancelled) The method according to claim 35 wherein the light guide is fiber optic.

42.(cancelled) The method according to claim 35 wherein the light guide has a top surface to which the scintillator is attached and the top surface is substantially planar.

43.(cancelled) An imaging system, which defines an optical path therein, for capturing an image from the image-bearing radiation, the imaging system comprising a solid radiation bearing detector disposed in the optical path, to convert the image-bearing radiation into a visible light spectrum with a high spatial accuracy;

a photocathode, disposed within the camera housing along the optical path to convert the converted radiation into a stream of electrons representative of the image-bearing radiation;

an image amplifier disposed in the stream of electrons such that image amplifier electrostatically accelerates the stream of electrons, and an amplified detector disposed after the image amplifier and, upon input of the stream of electrons, being adapted to generate secondary electrons to further amplify the image represented thereby such that the amplified detector then converts secondary electrons into an electronic signal representative of the image.

44.(cancelled) A radiation imaging system, comprising a radiation source

that projects radiation towards an object, thereby creating image-bearing radiation from the object towards the imaging system, and

an imaging system, which according to claim 43 has a solid radiation bearing detector comprising a scintillator which efficiently converts the image-bearing radiation into a visible

light spectrum.

45.(previously presented) An imaging system, which defines an optical path therein, for capturing an image from the image-bearing radiation, the imaging system comprising a solid radiation bearing detector disposed in the optical path, comprising a very thin, about 50 to 100 micro-meter thick, and very heavy scintillator with a density greater than 6, which efficiently converts the image-bearing radiation into a visible light spectrum with a high spatial accuracy;

a photocathode, disposed within the camera housing along the optical path to convert the converted radiation into a stream of electrons representative of the image-bearing radiation;

an image amplifier disposed in the stream of electrons such that image amplifier electrostatically accelerates the stream of electrons, and an amplified detector disposed after the image amplifier and, upon input of the stream of electrons, being adapted to generate secondary electrons to further amplify the image represented thereby such that the amplified detector then converts secondary electrons into an electronic signal representative of the image.

46.(previously presented) A radiation imaging system, comprising a radiation source that projects radiation towards an object, thereby creating image-bearing radiation from the object towards the imaging system,

and

an imaging system, which according to claim 45 has a solid radiation bearing detector, comprising a very thin, about 50 to 100 micro-meter thick, and very heavy scintillator with a density greater than 6, which efficiently converts the image-bearing radiation into a visible light spectrum with a high spatial accuracy.

47.(previously presented) The imaging system according to claim 46, wherein the image amplifier is adapted to selectively electronically de-magnify the image-bearing radiation and thus adjust a resolution of the image.

48.(previously presented) The imaging system according claim 47, wherein the image amplifier is dynamically selectable to adjust de-magnification so as to govern an area of an object to be imaged.

49.(previously presented) The radiation imaging system according to claim 46, wherein the radiation source is adapted to electronically shift between a plurality of dynamically selectable positions such that the image transmitted by the image-bearing radiation changes for each of the plurality of positions.

50.(previously presented) The radiation imaging system according to claim 49, wherein the radiation source electronically shifts between two dynamically selectable positions to generate

stereo pairs of three–dimensional images and to select the line–of–view of an object of interest to bypass other shadowing objects.

51. (previously presented) The radiation imaging system according to claim 49, wherein the radiation source is continuously deflected producing a plurality of radiation shadows that can be interactively "focussed" to various levels within the object.

52. (previously presented) The radiation imaging system according to claim 49, wherein the radiation source projects divergent rays of the radiation and has a spot size smaller than a resolution of the radiation imaging system.

53. (previously presented) The imaging system according to claim 45, further comprising:

filtering means for filtering the image–bearing radiation consecutively through a plurality of filters thus creating a plurality of sub–images;

analysis means to distinguish between the changes of sub–images due to the filtering of the radiation and due to the object motion during and between the exposures; and

correcting means for correcting the changes of the plurality of sub–images due to the object motion and correlating the plurality of sub–images into a color image.

54.(previously presented) The radiation imaging system according to claim 46, wherein the imaging system corrects for motion in a color image generated by capturing two or more consecutive sub–images, the imaging system further comprising,

calculation means for calculating the shift vector between the two or more consecutive sub–images, using lists of characteristic quantities computed from the images;

mapping means for mapping a coordinate transformation of a first image into a second image of the two or more consecutive sub–images;

computing means for computing corresponding transformations of the two or more consecutive sub–images by interpolation; and

reconstruction means for reconstructing the image from the two or more consecutive sub–images.

55.(previously presented) The radiation imaging system according to claim 54, further comprising processing means for differentiating between foreground and non–uniform background in the plurality of radiation shadows such that the non–uniform background can be subtracted from the image.

56.(previously presented) The radiation imaging system according to claim 55, wherein the processing means is adapted to replace one background with a second background.

57.(previously presented) The imaging system according to claim 45,

wherein the amplified detector has a radiation-stable "dead layer" created by ion implantation.

58. (previously presented) The imaging system according to claim 46, further comprising optic means disposed within the camera housing for collecting the image-bearing radiation and defining the optical path, where the optic means is integral with the scintillator.

59. (previously presented) The radiation imaging system according to claim 46, wherein the scintillator has a density of at least 7.5 grams per cubic centimeter.

60. (previously presented) The imaging system according to claim 45, comprising

a solid radiation bearing detector which is a flexible optic light guide system made of many tiny about 5 micro-meter diameter fibers, and a light source thereby creating image bearing radiation from the reflected light from the object;

a photocathode which converts the radiation bearing light, reflected from object and transmitted through the fibre optic light guide system into streams of electrons, which can be gated according to their arrival time at the high voltage electrodes;

an image amplifier disposed in the stream of electrons such

that the image amplifier electrostatically accelerates or decelerates the stream of electrons according to their arrival time; and

an amplified detector disposed after the image amplifier and, upon input of the stream of electrons, being adapted to generate secondary electrons to further amplify the image represented thereby such that the amplified detector then converts secondary electrons into an electronic signal representative of the image.

61.(amended) The imaging system according to claim 60, wherein the photocathode is fabricated of gallium-arsenide, which, with the scintillator removed, converts the infrared radiation bearing light, reflected from the object and transmitted through the fibre optic fight guide system, into streams of electrons, which are gated according to their arrival time at the high voltage electrodes, [-electrodes,] to analyze the time dependent images at the detector, after an initial flash from the light source has been emitted and reflected.

62.(previously presented) The imaging system according to claim 60, wherein the image amplifier is adapted to selectively electronically magnify the image-bearing radiation as measured at the detector and thus adjust a resolution of the image.

63.(previously presented) The imaging system according to claim 62, wherein the image amplifier is dynamically selectable to adjust

magnification so as to govern an area of an object to be imaged.

64.(amended) The imaging system according to claim 45, with the scintillator removed, further comprising:

filtering means for filtering the image-bearing radiation consecutively through a plurality of wavelength filters which allows only light within preselected ranges of wavelengths to pass, so that a "colored" ["colored"'] image can be formed using these sub-images of different wavelengths; [wavelengths,] analysis means to distinguish between the changes of sub-images due to the filtering of the fight of different wavelengths and due to the object motion during and between the exposures; and correcting means for correcting the changes of the plurality of sub-images due to the object motion and correlating the plurality of sub-images into a color image.